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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/602,814	11/20/2000	Masao Takeuchi	82493.0002	9608

7590 03/04/2002

Hogan & Hartson LLP
Suite 1900
500 South Grand Avenue
Los Angeles, CA 90071

EXAMINER
KERNS, KEVIN P

ART UNIT	PAPER NUMBER
1725	4

DATE MAILED: 03/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF4

Office Action Summary	Application No.	Applicant(s)	
	09/602,814	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	Kevin P. Kerns	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 23 June 2000 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on June 24, 1999 and June 9, 2000. It is noted, however, that applicant has not filed certified copies of the Japanese applications as required by 35 U.S.C. 119(b).

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "29" has been used to designate both electrodes (page 8) and pads (page 13). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because Japanese text is present in the Figures. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: on page 7, line 1, the word "happen" should be changed appropriately, as the meaning of that

sentence is unclear. On page 9, lines 20, it is unclear what is meant by "extra balls occur". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning repugnant to the usual meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). The terms "sucked" and "sucking" in claims 1, 5, 7-9, 11, and 13, are used by the claims to mean "forcibly held", while the accepted meaning is "vacuum" or "evacuation of air or gas".

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al. (US 5,890,283) in view of either Sakemi et al. (US 5,655,704), Sakai (US 5,867,260), or Nakazato (JP 8-115942).

Sakemi et al. ('283) disclose an apparatus and method for mounting electrically conductive balls, the apparatus of which includes the following structures: a positioning mechanism, a ball supply device (with bottom area less than 80% coverage due to spherical packing), a ball transfer head, a spring (force energizing device), guide shafts

(moving mechanism) for moving the ball transfer head in the x- and y-directions, a workpiece with associated positioning means, a vacuum unit to hold the conductive balls (in which the suction holes have bellows-shaped openings), an ultrasonic vibrator, and a flux/adhesive reservoir (abstract; column 1, lines 7-10 and 35-67; column 2, lines 1-10; column 3, lines 42-50; column 4, lines 1-10, 26-40, and 53-65; column 5, lines 13-30; column 6, lines 10-25; and Figures 1-8). The spring resiliently supports the head, and the head is lowered and raised appropriately for subsequent adhesion to flux or other adhesive (abstract; column 1, lines 52-67; column 2, lines 1-10; column 5, lines 30-48; and Figures 3-5). Pressing forces F1 and F2 are established for flux adhering and ball mounting steps, respectively (column 7, lines 19-26 and 66-67; and column 8, lines 1-30). One of ordinary skill in the art would have recognized that the use of a hammer rather than the ultrasonic vibrator would also result in dislodging of the conductive balls from the workpiece, as these dislodging means are well-known functional equivalents. Sakemi et al. ('283) do not specifically disclose a separate clamping means and process to hold the energized force applied by the spring.

However, Sakemi et al. ('704) disclose a method and apparatus for mounting soldering balls onto electrodes, in which clamping means and subsequent clamping steps are used for supporting a template frame for rigidly fixing the structure (abstract; column 3, lines 63-67; column 4, lines 1-7; column 5, lines 17-40; column 6, lines 1-7; and Figures 1-4). In addition, Sakai teaches a conductive ball mounting apparatus and method in which the workpiece is clamped to a damper for obtaining a positioning section of the workpiece (abstract; column 3, lines 5-9; and Figures 1-11). Also,

Nakazato teaches a solder ball mounting apparatus in which an oscillator disposed on a clamper at the positioning part of a board is used for reliably mounting the solder balls onto the workpiece (abstract; and Figures 1-3). One of ordinary skill in the art would have readily varied the range of clamping force pressures depending on such factors as the weight and number of conductive balls, weight and size of the workpiece, etc. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the apparatus and method for mounting electrically conductive balls, as disclosed by Sakemi et al. ('283), by adding the clamping means and steps taught by either Sakemi et al. ('704), Sakai, or Nakazato, in order to support a template frame for rigidly fixing the structure (Sakemi et al.--'704; column 4, lines 3-7; column 5, lines 17-40; column 6, lines 1-7), to obtain a positioning section of the workpiece (Sakai; column 3, lines 5-9), or to reliably mount the solder balls onto the workpiece (Nakazato; abstract).

11. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazato (US 5,768,775) in view of either Sakemi et al. (US 5,655,704), Sakai (US 5,867,260), or Nakazato (JP 8-115942).

Nakazato ('775) discloses a mounting apparatus and method of mounting conductive balls, in which the apparatus includes the following structures: a positioning

mechanism, a ball supply device (with bottom area less than 80% coverage due to spherical packing), a ball transfer head, a spring (force energizing device), guide shafts (moving mechanism) for moving the ball transfer head in the x- and y-directions, a workpiece with associated positioning means, a vacuum unit to hold the conductive balls (in which the suction holes have bellows-shaped openings), an ultrasonic vibrator, and a flux/adhesive reservoir (abstract; column 1, lines 7-9 and 40-67; column 2, lines 1-8 and 24-67; column 3, lines 1-67; column 4, lines 1-30; and Figures 1-3). The spring resiliently supports the head, and the head is lowered and raised appropriately for subsequent adhesion to flux or other adhesive (abstract; column 1, lines 46-56; column 2, lines 33-42 and 51-62; column 3, lines 35-42; and Figures 1-3). One of ordinary skill in the art would have recognized that the use of a hammer rather than the ultrasonic vibrator would also result in dislodging of the conductive balls from the workpiece, as these dislodging means are well-known functional equivalents. Nakazato ('775) do not specifically disclose a separate clamping means and process to hold the energized force applied by the spring.

However, Sakemi et al. ('704) disclose a method and apparatus for mounting soldering balls onto electrodes, in which clamping means and subsequent clamping steps are used for supporting a template frame for rigidly fixing the structure (abstract; column 3, lines 63-67; column 4, lines 1-7; column 5, lines 17-40; column 6, lines 1-7; and Figures 1-4). In addition, Sakai teaches a conductive ball mounting apparatus and method in which the workpiece is clamped to a damper for obtaining a positioning section of the workpiece (abstract; column 3, lines 5-9; and Figures 1-11). Also,

Nakazato (JP 8-115942) teaches a solder ball mounting apparatus in which an oscillator disposed on a clamper at the positioning part of a board is used for reliably mounting the solder balls onto the workpiece (abstract; and Figures 1-3). One of ordinary skill in the art would have readily varied the range of clamping force pressures depending on such factors as the weight and number of conductive balls, weight and size of the workpiece, etc. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the mounting apparatus and method of mounting conductive balls, as disclosed by Nakazato, by adding the clamping means and steps taught by either Sakemi et al. ('704), Sakai, or Nakazato (JP 8-115942), in order to support a template frame for rigidly fixing the structure (Sakemi et al.--'704; column 4, lines 3-7; column 5, lines 17-40; column 6, lines 1-7), to obtain a positioning section of the workpiece (Sakai; column 3, lines 5-9), or to reliably mount the solder balls onto the workpiece (Nakazato--JP 8-115942; abstract).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Wilson et al., Namekawa et al., Kawada, Sakemi et al., Arikado et al., Nakajima et al., JP 5-129374, JP 8-107121, JP 9-018129, JP 11-017324, JP 11-243103, and JP 2001-071218 references are also cited to show related art. Any

inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK
kpk
February 23, 2002

M. ALEXANDRA ELVE
PRIMARY EXAMINER